Travel-related Parasitic Infections

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Abstract: Among various kinds of tropical diseases, which tourists to tropical areas may be exposed to and return home infected with, the most important one from the Korean view point is malaria. The life cycles of *Plasmodium falciparum* and *P. malariae* could hardly be established even after importation, however, one cannot completely rule out a possibility of re-establishment of tertian malaria, due to *P. vivax*, in Korea. In view of this possibility, the current malaria situation in countries of Western Pacific and Southeast Asia is briefly discussed.

Key words: *Plasmodium vivax*, *P. falciparum*, *P. malariae*, malaria, imported diseases, vector

In Korean medical circles, attention and interest in recent years have been focused on such topics as chronic degenerative diseases, cancer, traffic accidents, and environmental pollution. However, only slight attention has been paid to classical infectious diseases prevailing in tropical countries which have found their way to our country due to rapid development of international air travel. At the present time, many tourists, who unknowingly acquire some form of infection overseas, are returning home every day, most of them going unnoticed by quarantine services. Physicians should know the risks of exotic diseases, their geographical distribution, and both prophylactic and therapeutic strategies.

Among tropical diseases like malaria, schistosomiasis, filariasis, leishmaniasis, trypanosomiasis, amoebic dysentery and giardiasis, the most important one from the Korean view point, in light of receptivity and mortality, may be malaria. Although filariasis is endemic in some Southeast Asian countries, the possibility of its importation to Korea can be ruled out because the risk of filarial infection is related to numerous infective bites sustained by the

victim while staying in an endemic area for a long period.

The risk for Korean laborers working in the Middle East of acquiring bilharz schistosomiasis or tropical sores due to leishmania cannot be ruled out completely. Therefore, surveillance of Korean workers returning home should be carried out. Although Chagas' disease and leishmaniasis are very important diseases in South America, the risk for Korean immigrants seems to be minimal as most immigrants are city dwellers. Thus, assessing the overall risks of importation of tropical diseases, the author concludes that malaria is the most risky for Korean nationals.

In recent years, malaria chemoprophylaxis has become an increasingly complex problem because of the emergence of chloroquine-resistant strains of *Plasmodium falciparum* in many parts of the world (Wernsdorfer, 1983). Although a number of multidrug regimens against resistant organisms are currently available for use, none is 100 percent protective and all have side effects. Diagnosis of falciparum malaria is not easy due to irregularity of the fever pattern and a variety of clinical

manifestations arising out of the different organs affected. Nowadays, the tragedy of unnecessary deaths due to falciparum malaria has been reported in many parts of the world because of misdiagnosis or late recognition of the disease.

Even if *P. falciparum* and *P. malariae* are imported to Korea, the transmission of these 2 species of *Plasmodium* cannot be established in this country because of their long extrinsic phase. However, there was evidence of a transient local transmission of *P. malariae* in Korea in 1930 for an unidentified reason. As the endemicity of *P. vivax* was rampant in Korea in the past, one cannot rule out completely the possibility of re-establishment of the transmission of vivax malaria in Korea. However, considering the fact that the vector mosquito (*Anopheles sinensis*) is highly zoophilic, its vectorial capacity is low, and that pesticides are used extensively in agriculture, the re-establishment of vivax transmission in this country seems remote.

The key points of antimalaria measures applicable to Korea are (1) educating travelers on the prevention of malaria including chemoprophylaxis before leaving for tropical countries and (2) recognizing malaria promptly upon returning home in order to prevent unnecessary death. Therefore, understanding the current malaria situation in the neighboring Western Pacific countries is indispensable.

Despite the intensive efforts made against malaria between the 1950s and the 1970s, the disease remains a major health problem in many tropical countries (Lepez, 1980). According to available information, the overall world malaria situation has not improved in the last 15 years. Although some countries have been reporting downward trends, notably India and China, the malaria situation continues to deteriorate. In 1985, indigenous malaria cases occurred in about 100 countries and areas (WHO, 1985). Of a total world population of 4.9 billion, about 2.3 billion live in areas where antimalarial measures have been carried out. The total

number of clinical cases occurring on a global scale is very difficult to assess accurately, due to underreporting. According to estimates, which in the case of tropical Africa were based on the number of infections expected according to the degree of endemicity, the total incidence of malaria is in the order of 100 million cases annually (WHO, 1985, 1986 & 1987).

In the Western Pacific region, the malaria situation has worsened in 2 areas: one is the area where *An. balabacensis* is the main vector, such as countries in the Indochinese peninsula, some parts of the Philippines, and the State of Sabah of Malaysia; the other is the area where the main vector is *An. farauti* such as the Solomon Islands and Papua New Guinea. Both species of mosquito possess a high vectorial capacity. The disease, however, had been eradicated or has disappeared in Australia, Brunei Darussalam, Japan, the Republic of Korea, Singapore and Taiwan. A synopsis of the present malaria situation in countries of the Western Pacific and Southeast Asia is as follows:

China:

Malaria is still one of the major diseases in China. There was a further decline in malaria incidence from 904,000 cases in 1984 to 563,000 cases in 1985. Of the total number of cases reported in 1985, 400,000 (70%) were detected in the areas comprising Jiangsu, Shandong, Henan, Anhui, and Hubei, mostly along the Yang-tze River. In these areas, vivax malaria is the predominant species and *An. sinensis* is the only vector. As the vector has an exophilic habit, indoor spraying is ineffective. A relatively high prevalence of falciparum malaria was reported mainly in Guangdong (mostly from Hainan Island), Yunnan, and Guangshi Provinces. The appearance of chloroquine-resistant falciparum malaria in some areas in southern China and its tendency to spread northward poses a problem.

Brunei Darussalam:

The last indigenous case of malaria was reported in 1971. Malaria was eliminated from

this sultanate by organized control efforts. Effective surveillance helps to prevent a resurgence of the disease.

Hong Kong:

Three indigenous cases of malaria were detected in villages adjacent to mainland China in 1985. There were outbreaks of malaria epidemics with over 100 cases each year during 1983 and 1984. These epidemics were brought under control.

Indonesia:

Of a total of 163 million, 156 million people live in malarious areas. The developing resistance of mosquitoes to insecticides poses a problem. Of a total of 27 provinces, chloroquine-resistant falciparum malaria occurs in 22 provinces.

Malaysia:

In the peninsular Malaysia and the state of Sarawak, malaria continues to be very successfully controlled. The number of malaria cases has remained stable with about 10,000 cases and 1,000 cases, respectively. More than 90% of the total population live in areas free from malaria. Transmission of the disease is limited to the hilly and underdeveloped central areas north and east of the peninsula. In the state of Sabah, a total of 38,000 malaria cases were detected in 1985. *P. falciparum* is the predominant species, representing 80% of all infections, and its resistance to chloroquine is widespread.

Thailand:

Of a total of 46 million people, 11 million live in malarious areas. Imported malaria cases among refugees from Laos and Kampuchea poses a problem.

Solomon Islands:

The malaria epidemic which started in 1977 in the Solomon Islands may have reached its peak in 1984. The total number of cases recorded during 1985 was 40,000 out of the total population of 200,000 compared with 70,000 cases in 1984.

Lao People's Democratic Republic:

In this country, about two-thirds of the

population at risk are living in areas where control measures of varying intensity are being carried out. For the whole country the parasite rate is estimated to be 10~12%. Chloroquine-resistant falciparum malaria occurs and shows an R-I and R-II level response to the drug.

Papua New Guinea:

In this country, where malaria is mesoendemic to hyperendemic in most of originally malarious areas, no significant change in the situation has been observed in recent years. The overall slide positivity rate is about 40%. *P. falciparum* continues to be the predominant species accounting for 80% of all infections.

Vietnam:

The overall malaria situation did not change much. Malaria endemicity is lower in the northern provinces, whereas malaria remains a major health problem in the southern provinces. The antimalaria programme continuously suffers from various constraints and difficulties: an unstable epidemiological situation in the border areas of the northern provinces, increasing population movements, natural calamities, and technical problems (drug-resistant malaria parasites, exophily of the vector).

Philippines:

Malaria remains a serious health problem in rural areas. Following principles of primary health care approach, attempts are being made to control malaria by combining a variety of measures: residual insecticide spraying of houses, environmental management and administration of drugs. The antimalaria programme suffers from a shortage of funds.

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